GRASS
Growing Regional and Agricultural Students in Science

2021 UNE GRASS online series
Teacher PD workshops

Workshop overview

Zoom links will be provided on receipt of your registration

Monday 23 August 3.30 – 5.00pm

SCIENCE | Key Note Presentation

Building Success in Working Scientifically: Developing and Assessing the Working Scientifically skills

Dr Sham Nair & Mr Chris Bormann (NSW Dept. of Education)

Monday 30 August 3.30 – 5.00pm

SCIENCE

Primary investigations in Stage 6 science: Using Investigating Science as a model

Dr Sham Nair Mr Chris Bormann & Alexa Barr (NSW Dept. of Education)

Thursday 2 September 3.30 – 5.00pm

EARTH & ENVIRONMENTAL SCIENCE

School of Rock: supporting Stage 4 Science – Stage 6 Earth & Environmental Science

Dr Susan Filan (Australian Earth Science Education)

Monday 6 September 3.30 – 5.00pm

BIOLOGY

Biotechnology in action: using COVID-19 as a case study

Dr Gal Winter & Dr Mary McMillan (UNE)

Monday 13 September 3.30 – 5.00pm

PHYSICS

Teaching Kinematics and Dynamics in Physics using Rocketry

Mr Matt Dodds (Farrer Memorial Agricultural High School)

Monday 15 November 3.30 – 5.00pm

DATA SCIENCE

Going beyond the average: Representations of data to engage and enhance understanding

Dr Sham Nair, Mr Chris Bormann & Mr Joshua Westerway (NSW Dept. of Education)

Monday 22 November 3.30 – 5.00pm

CHEMISTRY

Teaching students to interpret ^{1}H NMR, ^{13}C NMR, IR and Mass spectra, including an analysis of previous HSC exam questions

Mr David Moffitt (Guyra Central School) & Dr Michelle Taylor (UNE)

Click here to register

Online registration and the details for the workshops can be found on the **UNE GRASS webpage** by following links to Teacher PD

Monday 23 August 3.30 – 5.00pm


SCIENCE | Key Note Opening Presentation

Building Success in Working Scientifically: Developing and Assessing the Working Scientifically skills

Dr Sham Nair & Mr Chris Bormann (NSW Dept. of Education)

In this workshop, Sham and Chris will share feedback and insights from the 2020 GRASS Teacher PD Depth Study workshops, on task design supporting the development of critical and creative thinking and Working Scientifically skills.

The skills for Working Scientifically are an important set of outcomes in all NSW science syllabuses. In Stage 6, the Working Scientifically outcomes constitute more than 50% of the formal assessments' weightings. This presentation and workshop will explore the role of the Working Scientifically skills in developing scientific knowledge. Furthermore, participants will examine strategies for developing the skills for Working Scientifically and how to assess those skills in various formats.

Monday 30 August 3.30 – 5.00pm


SCIENCE

Primary investigations in Stage 6 science: Using Investigating Science as a model

Dr Sham Nair Mr Chris Bormann & Alexa Barr (NSW Dept. of Education)

In this workshop, teachers will engage with the Stage 6 Investigating Science syllabus to learn about the deeper elements of scientific investigations.

This syllabus describes all of the building blocks that are important for conducting valid first-hand investigations. In doing so, teachers will improve students' readiness for Stage 6 science and enhance the learning opportunities presented in Stage 4 and 5 science investigative activities.

This workshop will introduce a unit of work suitable for a Year 12 Investigating Science class, while the format could easily be modified to be run as a depth study for other Stage 6 science courses. The unit will include a scope and sequence, activities to support the development of relevant skills, and a sample assessment framework.

Workshop participants will discuss and be supported in adapting this unit to meet the needs of their students. A follow up workshop in the live face to face event on Nov 29, will allow teachers to reflect, share and evaluate the unit.

Thursday 2 September 3.30 – 5.00pm

SCIENCE | EARTH & ENVIRONMENTAL SCIENCE

School of Rock: supporting Stage 4 Science – Stage 6 Earth & Environmental Science

Dr Susan Filan (Australian Earth Science Education)

Rocks tell us about past events in Earth's history, contain valuable resources and are the literal foundation upon which our cities are built.

Unfortunately, many students leave school with little interest in or knowledge of rocks. This presentation will address the continuum of learning from Stage 4 to Stage 6 EES with engaging activities to build deeper understanding of minerals and rocks. Teach your students (and yourself) how to read rocks - identify types of rocks based on the rock cycle, relate rock type to use and determine the history of your local area. Participants will engage in activities using readily available materials and will access online information about mineral/rock resources throughout NSW.

Monday 6 September 3.30 – 5.00pm

SCIENCE

Biotechnology in action: using COVID-19 as a case study

Dr Gal Winter & Dr Mary McMillan (UNE)

The outbreak of Covid-19 has been the most significant public health emergency of the 21st century.

The global response to the Covid-19 pandemic has been led by biotechnologists, who have been able to identify the pathogen, understand how the virus changes over time, identify the mode of transfer, develop diagnostic tests, and finally develop vaccines to protect against the virus. This virtual session will explore a number of these concepts, including viral evolution and how DNA technologies allow us to track pathogens over time and space, and the science behind vaccine development. Through this session, aligned with Modules 6, 7 and 8 of the NESA Stage 6 Biology syllabus, teachers will gather ideas for using real-world examples to teach students about different aspects of biotechnology and infectious disease. This session is separate from, but complementary to, the laboratory-based workshop on biotechnology.

Monday 13 September 3.30 – 5.00pm

PHYSICS

Teaching Kinematics and Dynamics in Physics using Rocketry

Mr Matt Dodds (Farrer Memorial Agricultural High School)

We chose to go to the Moon in this decade and do the other things, not because they are easy but because they are hard!" These words were part of John F Kennedy's famous 1962 Moon speech.

Fast forward more than 50 years and we have now entered a new space race, the commercialisation of space where both private industry and governments work together to allow humanity to continue to explore our solar system and universe beginning with sending humans to Mars. The space industry in Australia has started with UNSW Canberra building CubeSats and launching them into orbit. I do not expect all my students to become rocket scientists but when we are learning about forces, impulse, acceleration, kinetic energy, gravitational potential energy and Newton's laws of motion, we do it practically by examining how these parameters affect the launch of a rocket.

Learning by doing is a key pedagogy of science education. I teach my students rocketry and they pick up a variety of skills along the way. Join me to learn how I challenge and support my students so that they can learn rocket science by doing. Your students are tomorrow's engineers, physicists, astronomers and more!

Monday 15 November 3.30 – 5.00pm

DATA SCIENCE

Going beyond the average: Representations of data to engage and enhance understanding

Dr Sham Nair, Mr Chris Bormann & Mr Joshua Westerway (NSW Dept. of Education)

Representations of data, using visual representations to support deeper thinking and scientific analysis.

Histograms, desmos and other tools allow students to better understand how data can be used as evidence when drawing conclusions and evaluating limitations (error/uncertainty).

Participants will have access to a collection of tools for demonstrating and explaining core science topics along with learning activities that will engage their students in mathematical reasoning and evaluating data.

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Monday 22 November 3.30 – 5.00pm

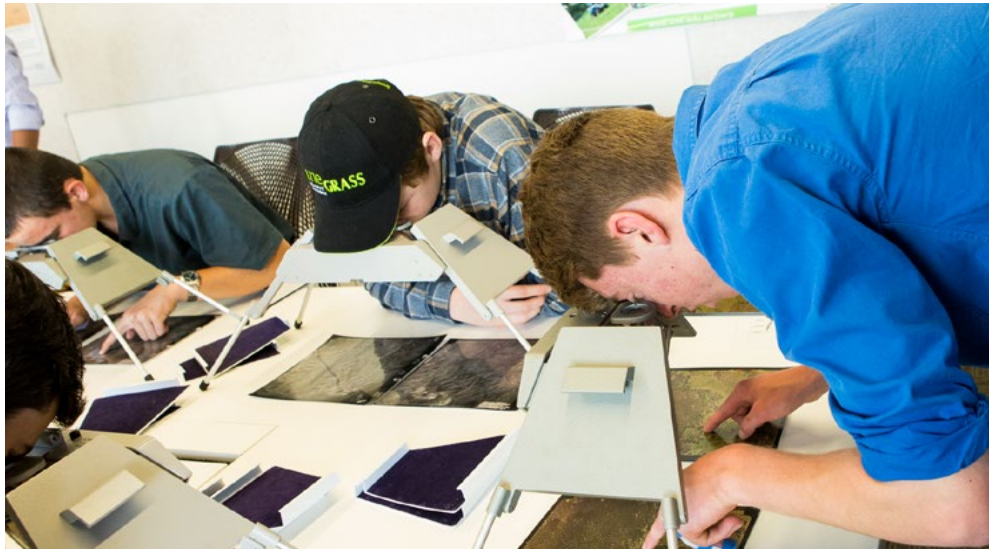

CHEMISTRY

Teaching students to interpret ^{1}H NMR, ^{13}C NMR, IR and Mass spectra, including an analysis of previous HSC exam questions

Mr David Moffitt (Guyra Central School) & Dr Michelle Taylor (UNE)

This workshop will allow teachers to better support students developing their use of deductive reasoning in the application of spectroscopic methods in structure determination.

Teachers will use a combination of IR, NMR and Mass spectra to deduce the identity of unknown organic compounds. Participants will explore HSC past paper questions and other examples to build teachers' confidence in applying this deductive approach. We will also look at effective ways of explaining the concepts behind each of the spectroscopy methods, including describing models that students can use to explain the processes. This workshop is aligned with Stage 6 NESA Chemistry course, particularly Module 8: Applying Chemical ideas, Analysis of Organic Substances



For further details and to view this program in an electronic format, please head to www.une.edu.au/grass/ and follow links to Teacher PD.

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